



Urban ecosystem modeling and global change: Potential for rational urban management and emissions mitigation

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Year: 2014
Journal: Environmental Pollution (Barking, Essex : 1987). 190: 139-149

Abstract:

Urbanization is a strong and extensive driver that causes environmental pollution and climate change from local to global scale. Modeling cities as ecosystems has been initiated by a wide range of scientists as a key to addressing challenging problems concomitant with urbanization. In this paper, 'urban ecosystem modeling (UEM)' is defined in an inter-disciplinary context to acquire a broad perception of urban ecological properties and their interactions with global change. Furthermore, state-of-the-art models of urban ecosystems are reviewed, categorized as top-down models (including materials/energy-oriented models and structure-oriented models), bottom-up models (including land use-oriented models and infrastructure-oriented models), or hybrid models thereof. Based on the review of UEM studies, a future framework for explicit UEM is proposed based the integration of UEM approaches of different scales, guiding more rational urban management and efficient emissions mitigation.

Source: <http://dx.doi.org/10.1016/j.envpol.2014.03.032>

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Ecosystem Changes, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

Climate Change and Human Health Literature Portal

Health Outcome Unspecified

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Mitigation

Model/Methodology:

type of model used or methodology development is a focus of resource

Computing System, Exposure Change Prediction, Methodology, Other Projection Model/Methodology

Other Projection Model/Methodology: discussion only

Resource Type:

format or standard characteristic of resource

Research Article, Review

Timescale:

time period studied

Time Scale Unspecified